



Yeoman Marine
Services Pvt. Ltd.

REMOTE EMBEDDED SYSTEMS' SUPPORT

RESS



RESS (Remote Embedded Systems' Support) is a ingenious MII (Make-In-India) product, which enables remote access and maintenance of ES (Embedded Systems) based high-end industrial/military equipment. Whilst remoting of computer systems as been a mainstream technology for years, the two unique factors which differentiate RESS from any other solution globally are:

- The ability to remote systems which may not be participative or designed to be remoted.
- The ability to provide this functionality over constrained networks with high-latency, low-bandwidth and high-jitter.

This is accomplished using multi-versatile, high-impedance (High-Z) taps and UHL (Ultra-High Latency) HMI (Human-Machine Interface) re-direction, along with several other multi-disciplinary technologies.

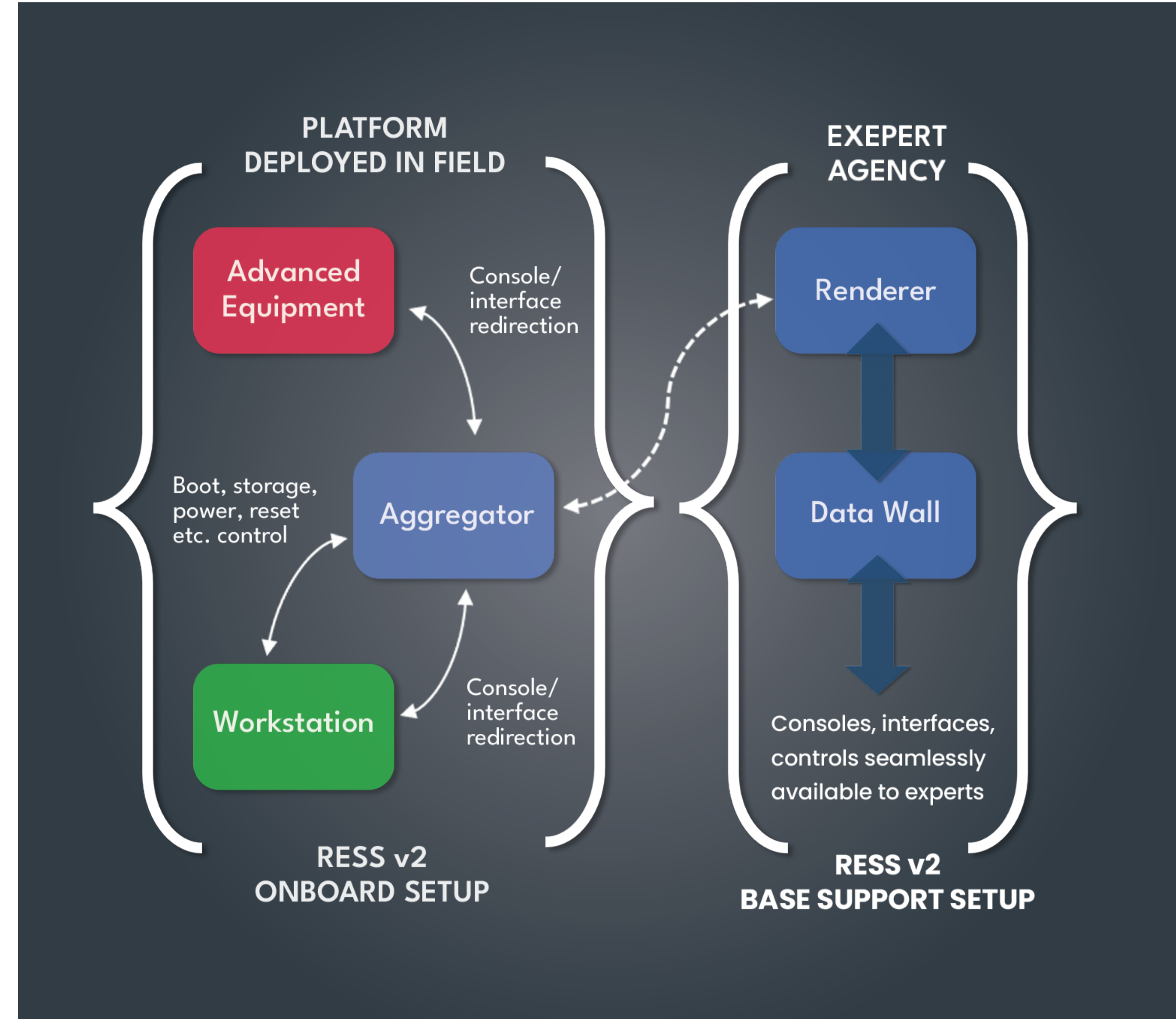


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RESS - THE CONCEPT



The portable Field-LinQ device is carried to location of the equipment needing support (on the field). The non-intrusive multi-versatile taps allow seamless connections to undertake analysis by local (on-field) crew. Integrated wide range of test equipment allow easy diagnostics. Wherever the help of external experts (at disjoint location, having the complementary Base-LinQ Setup) is needed, lightweight network spools are deployed back-to-back for connecting the Field-LinQ device to the closest point of network connectivity. Once connected, the external experts can access all local interfaces through re-directed consoles and work collaboratively to resolve the subject. Amidst intermittent connectivity, the state of ongoing activity is held, by the Field-LinQ device.



FUNCTIONALITY

RESS (Remote Embedded Systems Support) provides a comprehensive man-portable 'Lab-in-a-Box' for maintaining and supporting advanced field equipment used by industry in general and military in particular. The LinQ setup provides a comprehensive environment for operating, testing, monitoring and maintenance of Embedded Systems collaboratively, by the frontline crew and base support organizations, securely using satellite, wireless or land-based data communication networks and supporting air-gapped data exchange where applicable.

Remote Access to Interfaces / Consoles

Operation on Constrained Networks

Removable Secure Data Storage Cartridge

Multi-Versatile High-Z Taps

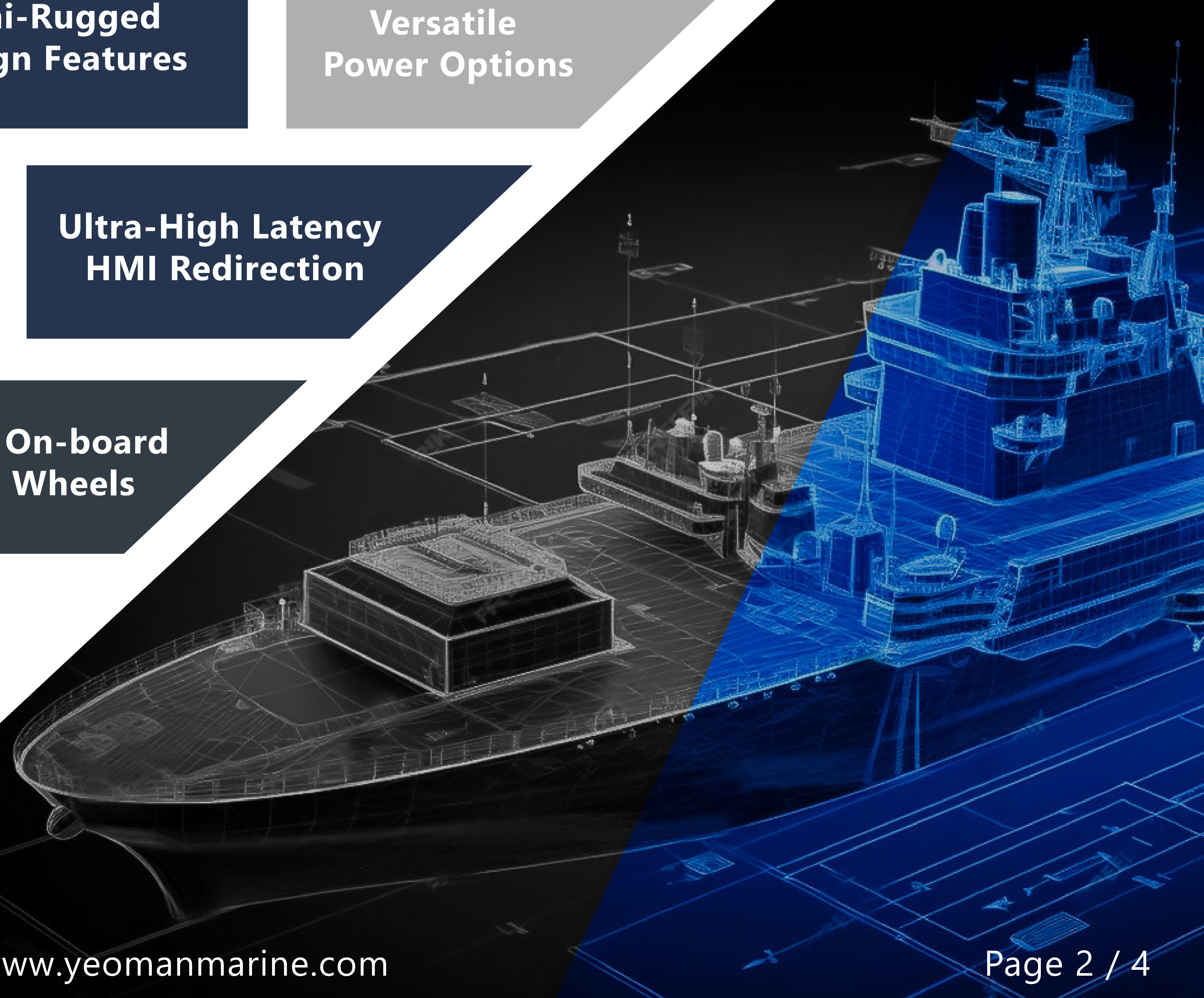
Semi-Rugged Design Features

Versatile Power Options

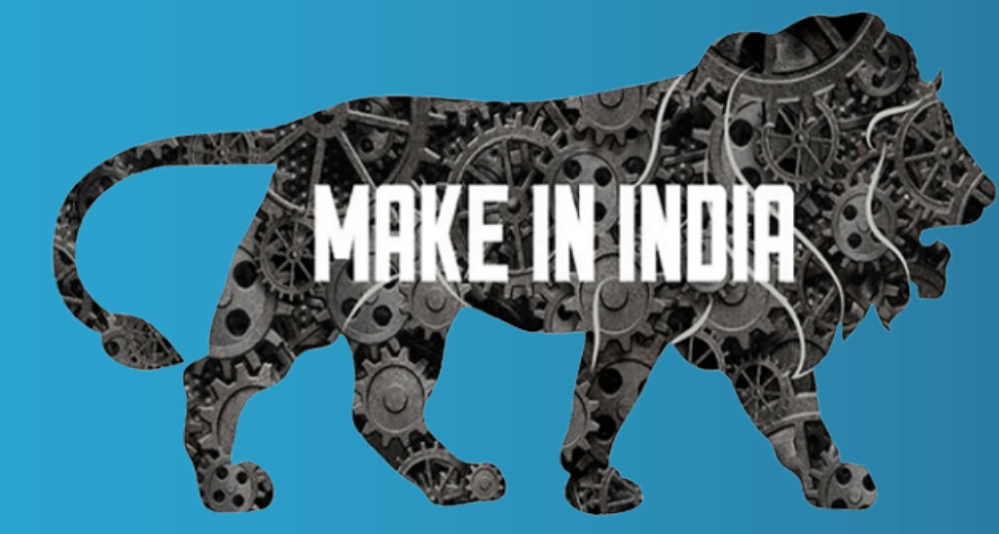
Removable Common Test Equipment

Ultra-High Latency HMI Redirection

Manportable On-board Setup with Wheels



RESS - SUMMARY OF FEATURES



FIELD - LINQ

RESS V2 ONBOARD SETUP

- Comprehensive 'Laboratory-in-a-Box' with integrated tools for operating, testing, monitoring and maintaining Embedded Systems (ES).
- Multiple boot environments to address maintenance of diverse ES Operating Systems (OS), software and file-systems.
- Comprehensive hardware and software suite for backup and restoration of Memory Media Devices (MMDs) of various types, including legacy and obsolete ones, as used in ES of industrial and military equipment, including forensic level write blocking functions.
- Hot-pluggable secure data cartridge for software repository with electronic logic safety.
- Integrated Common Test Equipment (CTE), including multi-channel oscilloscope, multi-meter, logic analyser, signal generator, programmable power supply etc., with provision of customised add-ons.
- Integrated multi-panel, multi-input, multi-synch video display solution with support for non-standard display modes used in proprietary industrial / military equipment.
- Multi-versatile and legacy ports with non-intrusive high-impedance taps.
- Simultaneously capture, display and remote multiple interfaces like Human Machine Interfaces (HMI), of Embedded Systems, Graphical User Interfaces (GUIs) and display streams of various resolutions and refresh rates.

BASE - LINQ

RESS V2 ONBOARD SETUP

Comprehensive solution for seamless remote access to multiple Field-LinQ Devices simultaneously.

- Compact man-portable industrial design, with integrated set of basic slide-out HMI devices.
- Multi-tasking collaborative applications are freely configurable on the flexible data-wall setup.
- Unified drive for multiple Video Display Units (VDUs) of different types and specifications.



REMOTE EMBEDDED SYSTEMS SUPPORT



COMMON FEATURES

FOR BOTH ONBOARD AND BASE SUPPORT SETUPS

- Remote operation over severely constrained high-latency, low-bandwidth and high-jitter data communication networks, including wireless and satellite links, as may be encountered in remote industrial and military environments.
- Day Light Viewable (DLV) displays with high brightness of up to 1,000-NITS. Embedded colour touch-screen display for monitoring and security functions.
- Multi-point, multi-modal information security underlay including electronic logic, data-diode, analogue dither, and multi-layer encryption.
- Collaborative features including chat, whiteboard and video relay optimized for remote support use cases.
- Primary Operating System and applications are based on embedded, non-persistent and highly-secure implementation of BOSS (Bharat Operating Systems Solutions) Linux.
- Rugged features, like full all-round hard protective casing, air-gap cushioning, securing hard-points, lockable keyed connectors, EMI (Electro-Magnetic Interference) shielding etc.

FIELD NET

Active (self-powered) and passive networking spools which can be freely laid out in field (or onboard) and cascaded back-to-back for ex-tending network connectivity from closest access point to the location of the equipment.



THE LINQ ECOSYSTEM



The concept behind LinQ ecosystem is to have two complementary range of devices; viz. Aggregators and Renderers, which seamlessly work together to provide comprehensive data-handling and presentation capabilities. The Aggregators collect data on-field from a large heterogeneous mix of interfaces, ports and standards. This captured data is encapsulated, encrypted and streamed over any available network. Streams from multiple Aggregators are collated by Renderers, which route them to processing elements running user-specific algorithms or directly present the extracted data on any HMI (Human Machine Interface) or a Data-Wall.

LinQ devices provide a complete ecosystem for synchronized aggregation of data, available in varied formats, from multiple sources, and then streaming the aggregated data on IP (Internet Protocol) networks and at a central location, rendering this data for further processing / analytics.

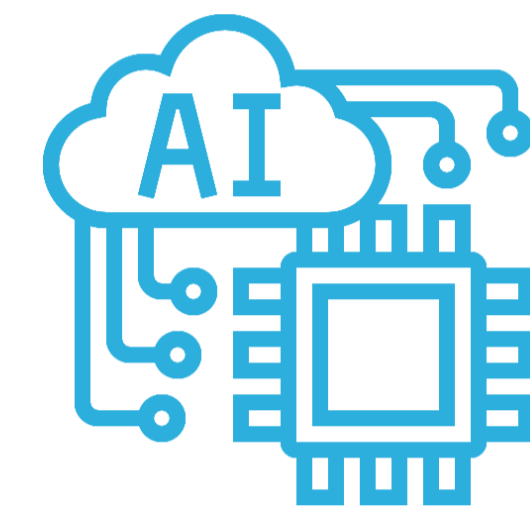
The ecosystem segregates the complexities of data collation from data processing, thus enabling rapid design, prototyping, development and deployment of data hungry applications. The devices automate the crucial tasks of capturing, digitizing, encapsulating, aggregating, synchronising, encrypting, transporting, distributing and rendering multiple data streams, over a centralised, distributed or hybrid architecture.

LinQ devices support a wide range of data streams and protocols, from very low bandwidth serial protocols to MIL STD (Military Standard) communication to CCTV (Closed Circuit Television) feeds over IP to ultra-high bandwidth 8K video display streams, making them the Swiss Army Knife in any data handling tool-kit.

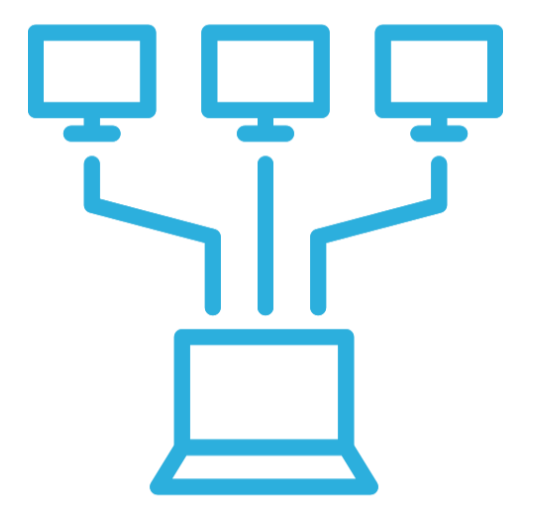
APPLICATIONS



CCTV Feed Aggregation



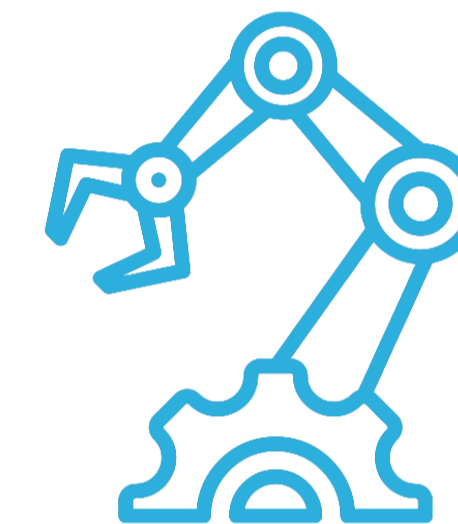
Cloud, AI, ML & Data Analytics



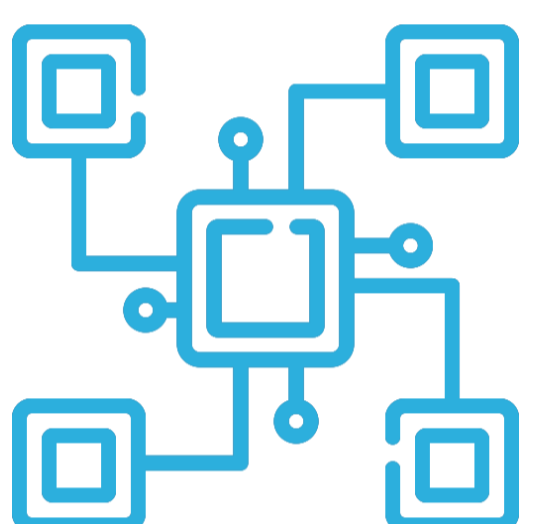
Remote Monitoring



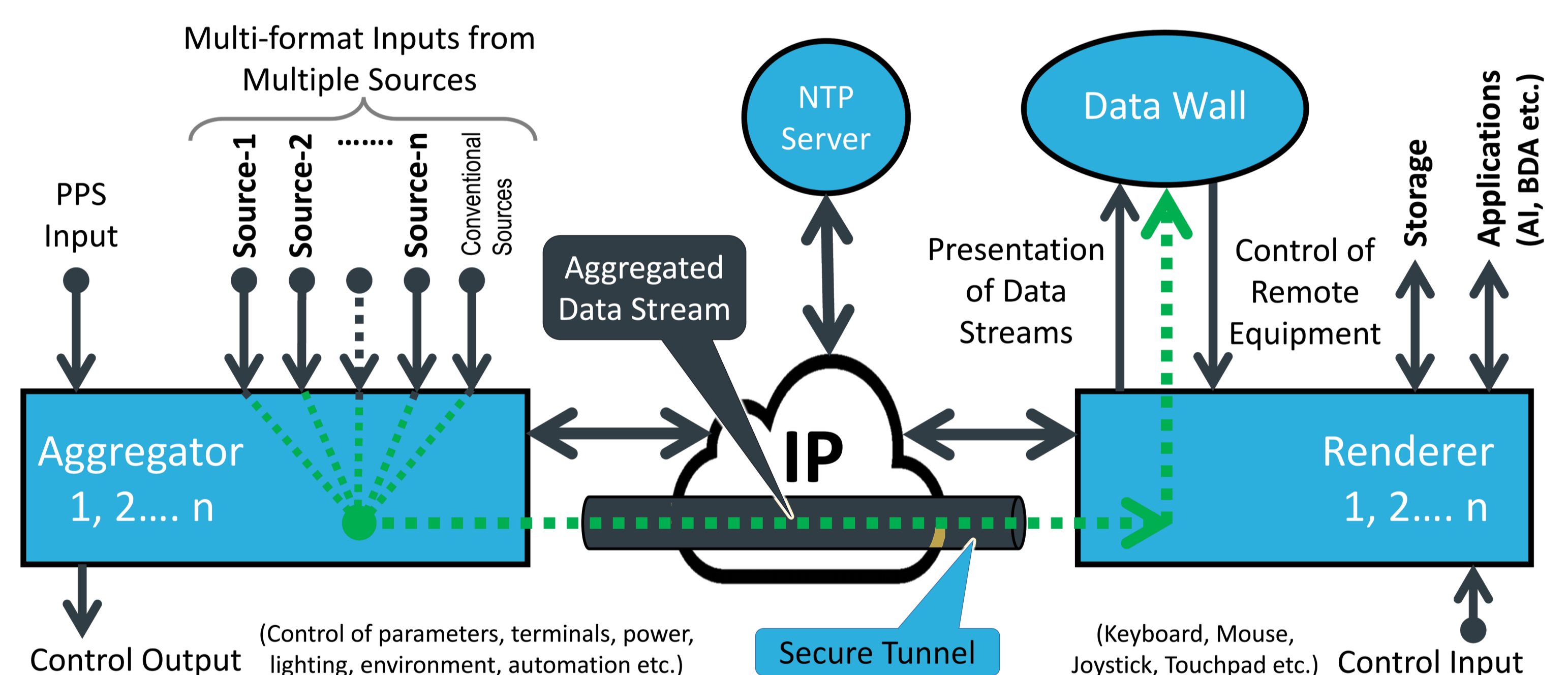
Video Feed Consolidation



Industrial Automation



Sensor Grid Integration



The LinQ devices are available in various types and form factors, from rackmount chassis to IP68 rated rugged devices which can be deployed on-field and are capable of withstanding the harshest of the environments.

The LinQ line-up includes NTP (Network Time Protocol) servers, with multiple alignment sources like PPS (Pulse Per Second) input from GNSS receivers, for time-aligning all devices for synchronised input-output. LinQ devices can also be added with remote-control functions like KVM (Keyboard-Video-Mouse) for classical applications like remote IP based KVM console management, but with very-high reliability and security including customised encryption. Built-in features of these KVM enabled devices, like aggregation of data streams, can provide unparalleled automation solutions in Industry 4.0 setups, or high-reliability and rugged military oriented solutions.

